REMARKS

In an Office Action mailed on September 12, 2007, the Examiner rejected claims 31-34, 37-38 and 40-52. These rejections are respectfully traversed. Claims 31-34-37-38 and 40-52 remain pending. In light of the following arguments, Applicants respectfully request that this application be allowed.

In the Office Action, the Examiner rejects claim 31 under 35 U.S.C. §103(a) as being obvious from U.S. Patent No. 5,284,492 issued to Dubin (Dubin) in view of U.S. Patent Number 3,756,794 issued to Ford (Ford), WO published application 95/27021 on behalf of Gunnerman (Gunnerman) and U.S. Patent No. 5,669,938 issued to Schwab (Schwab). In order to maintain a rejection the Examiner has the burden of providing evidence of prima facie obviousness. See MPEP §2143. See also In Re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). In order to prove prima facie obviousness, the Examiner must provide evidence in the prior art of a motivation to combine or modify a reference, a reasonable expectation of success, and a teaching of each and every claimed element. Id. The Examiner has failed to provide references that teach each and every claimed element of amended claim 31 or a proper motivation to combine the references.

The specification, on Page 9, second paragraph, discloses the use of coupling agents to maintain stability at high temperatures and pressures. These coupling agents are di and tri acids of the

Diels-Alder adducts of unsaturated fatty acids. These acids are neutralized with an alkanolamine to form a water soluble salt.

Dubin does disclose the use of di and tri-acids as created (no neutralization) as lubricity enhancers. This discussion in column 7, lines 15 through 65. However, for use as lubricity enhancers, these compositions have to be oil soluble so that they remain in the oil phase.

The present invention utilizes the Diels-Alder adducts as coupling agents, after they have been neutralized to form a water soluble salt, as contrasted with Dubin, who uses them with no modification.

It is respectfully urged that the examiner has failed to consider that not only are the Diels-Alder adducts added for a different reason, they are also chemically different, which results in their behavior being different. It does not matter that Dubin discloses non-neutralized Diels-Alder used aslubricity enhancers, as he does not teach the use of neutralized Diels-Alder adducts as coupling agents. It is respectfully submitted that using different compositions for different purposes is not obvious.

The examiner implies that Column 8, lines 37-45 of Dubin indicates the Dubin teaches that the Diels-Alder adducts aid in emulsion stability. Careful reading of the Dubin reference shows that Dubin speaks to emulsions made with and without a emulsification system, the emulsification

system aiding in emulsion stability. In lines 37-40 Dubin is merely stating that the most logical method of adding the lubricity enhancers is in the emulsification system, not that they aid in the stability of the emulsion.

It is respectfully submitted that the combination of Dubin with the other references does not render the claimed invention obvious. The examiner states that Ford discloses diesel fuel emulsions that use ammonium nitrate as both a freezing point depressant and an emulsion stabilizer. Ford does mention that the combination of ammonium nitrate and urea has surprising stability, but he does not ever discuss the use of ammonium nitrate (by itself) as a stabilizer, and is only referring to how that particular mixture performed in relation to the other mixtures examined in the specification. Considering that Ford's water contents are 0.75% to 12% by weight for an oil dispersed fuel (water the continuous phase), and considering all of the work in the specification deals with 1 to 2% water contents, this is a fundamentally a very unique emulsion and that is obvious to one skilled in the art. His ammonium nitrate concentrations are very high, obtaining 50% of the aqueous phase, which is far higher than the amount used in the present invention. The chemical behavior of this concentration would obviously be different that the more dilute usage in the present invention. It would not be obvious to one skilled in the art that the same combination would work effectively at higher water concentrations with different surfactants (Ford primarily uses condensates of alkyl phenols, alkylene oxides, octylphenols and ethylene oxides while present invention uses primarily polyethoxylated nonylphenols)

Schwab (5,669,938) teaches the use of fuel-soluble organic nitrate ignition improvers, but for a water in oil emulsion (oil being the continuous phase). It is obvious that the combustion behavior of water continuous or oil continuous emulsified fuels must be different (water continuous, for instance, could not conceivably under go secondary atomization), thus there is no expectation that what works for one may will work for the other. Operationally, these different compositions would perform in substantially different fashions. Thus, Schwab does not teach, especially to one skilled in the art, that fuel soluble organic nitrates will work in water continuous fuels.

Turning again to Dubin, the reference specifically states that the disclosed fuel is for use in an electric power generating gas turbine. This is thus a fuel that will be burnt in an open flame, without exposure to serious temperature or pressure fluctuations from its point of manufacture to its point of combustion, with no recycle. The fuel is drawn from the tank, goes through the fuel-metering pump, and into the combustion chamber. The fuel-metering pump is usually located where it is exposed to very little heat from the combustion. Also, for this use the engine and fuel storage is not in an area of extreme environmental changes.

This is not true for a fuel for an internal combustion engine. Fuel for an internal combustion engine must withstand high temperatures and pressures from the fuel pumps, injectors, and block heat. Some portion of the fuel will always be recycled to the fuel tank, and thus must withstand multiple cycles of being pressurized by the fuel pump, heated by the engine (as the fuel pump is not only mounted on the engine but so is the injector block), and then cooling in the fuel tank.

Also, the engine and fuel (especially in the transportation use) of an internal combustion engine can be exposed to extremes of heat and cold.

Accordingly it is clear, even to one not skilled in the art, that a fuel that works well in the fairly well-controlled environment of an electric power generating gas turbine may not be appropriate to use in an internal combustion engine. For one skilled in the art, Dubin's teachings may provide baseline information for the development of an emulsion, but no more than that provided by standard books on the subject. In fact, there are substantial developmental differences:

a) Dubin does not speak to high temperature fuel stability at all. Neither does Schwab or Ford. Gunnerman does, however, only a minor mention of the use of alcohol for that purpose is found in the specification. Another area mentions the use of additional emulsifier for high temperatures. Also, Gunnerman speaks of temperatures of 1700˚F or above, which is substantially higher than the 160˚ to 200˚F usually seen in internal combustion fuel systems. Thus, one skilled in the art would have no source of information in the above patents to develop a fuel that could withstand use in a conventional internal combustion engine. Thus, the use of coupling agents or ammonium nitrate for this purpose was not taught in any of the above references.

b) Also, none of the references disclose the use of neutralizers to control the creation of acid in the fuel as claimed in the present invention.

c) None of the above patents speak to the use of an ignition improver that also functions as an emulsion stabilizer.

Thus, taken in total, even though some of the references may have taught portions of the information, Dubin could not be used to tie them all together as it lacks the teaching the extrapolate between the materially-different environments of a power generating turbine and a internal combustion engine. Further, Dubin teaches the use of non-neutralized and thus chemically-different di and tri acids of the Diels-Alder adducts of unsaturated fatty acids, for a completely different purpose. There is no teaching or suggestion in Dubin that the di and tri acids of the Diels-Alder adducts of unsaturated fatty acids be neutralized as presently claimed. There is no motivation that has been suggested by the examiner for this modification of these components of the Dubin composition. None of the remarks made by the examiner address the use of "a di-acid of the Diels-Alder adducts of unsaturated fatty acids and a tri-acid of the Diels-Alder adducts of unsaturated fatty acids and wherein said neutralizer combines with a select acid to form a water soluble salt" as claimed. The fact that Dubin teaches use of non-neutralized and thus chemically-different di and tri acids of the Diels-Alder adducts of unsaturated fatty acids as a lubricity agent is not persuasive, since the water-soluble di and tri acids as claimed do not act as lubricity agents since they are not oil soluble.

Claims 32-34, 37-38, and 40-52 are dependent from claim 31. Thus, claims 32-34, 37-38, and 40-52 are allowable for at least the same reasons as claim 31. Therefore, Applicants respectfully request that the rejections of claims 32-34, 37-38, and 40-52 be removed and claims 32-34, 37-38, and 40-52 be allowed.

If the Examiner has any questions regarding this application, the Examiner may telephone the undersigned at 775-586-9500.

Respectfully submitted,
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